JP 2002-95426

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to the edible film which a canal layer is formed on the edible base film used for packing of food etc. still in detail about an edible film, and changes.
[0002]
[Description of the Prior Art] By packing the powdered soup of instant Chinese noodles or instant noodles or a seasoning, dehydrated vegetables, etc. by packing materials, such as a bag using the edible film which consists of water-soluble polysaccharide, such as a carrageenan, at the time of transportation and preservation, the quality and the gestalt of contents are maintainable, and at the time of cooking, contents can be contacted in boiling water, without a packing material's melting and breaking a packing material by covering boiling water over a packing material. However, in the packing material using the edible film which consists only of water-soluble polysaccharide, since moisture permeability-proof is inferior as compared with the packing material by which others are used widely, using for a packing material the edible film with which canal layers, such as a wax of a food grade, were formed on the edible base film which consists of water-soluble polysaccharide is proposed (for example, references, such as JP,63-240752,A).
[0003]
[Problem(s) to be Solved by the Invention] According to the packing material using the edible film with which canal layers, such as a wax of a food grade, were formed on the edible base film which consists of water-soluble polysaccharide, moisture permeability-proof can be improved as compared with the packing material which consists only of an edible base film. However, it became clear that the moisture of food leaks out through an edible film also with the edible film whose moisture permeability-proof improved in packing food with much moisture of raw bean paste etc. For this reason, improvement in the further moisture permeability-proof of an edible film is called for. Moreover, the edible film which consists of water-soluble polysaccharide, such as a carrageenan, is inferior to general-purpose plastic film in heat-sealing nature, and packing materials, such as a bag, cannot be formed easily, but improvement in the heat-sealing nature of an edible film is also called for. Then, the technical problem of this invention is rather than the edible film which consists of the edible film which consists of water-soluble polysaccharide, such as the conventional carrageenan, to offer the edible film moisture permeability-proof and whose heat-sealing nature improved.
[0004]
[Means for Solving the Problem] As a result of inquiring that the aforementioned technical problem should be solved, this invention person etc. to the whole surface side of the edible base film which mixed and formed an agar and gelatin The edible film in which the canal layer which consists of the wax of a food grade etc. was formed As compared with the edible film in which the canal layer which consists of the wax of a food grade etc. was formed, it found out that moisture permeability-proof and heat-sealing nature could be improved, and the whole surface side of the edible base film which consists

only of an agar or gelatin was reached at this invention. The edible base film with which the water-soluble polysaccharide and gelatin which are used for packing of food etc. were mixed and formed at least this invention namely, to a whole surface side It is the edible film which the canal layer which is chosen from the waxes, the natural resin, and the emulsifier which are used as a food grade, and which makes a kind a principal component at least is formed, and changes. JIS of this edible film The steam transmittance measured based on Z-0208 It is in the edible film characterized by being smaller than the steam transmittance of the edible film which the same canal layer as the aforementioned canal layer is formed on the edible base film formed only from the aforementioned water-soluble polysaccharide or gelatin, and changes.

[0005] In this this invention, the moisture permeability-proof of an edible film can be improved by setting the mixing ratio (water-soluble polysaccharide / gelatin) of the water-soluble polysaccharide of an edible base film, and gelatin to 2 / 8 - 8/2 (especially 2 / 8 - 6/4). Furthermore, the moisture permeability-proof of an edible film can be further improved by forming an edible base film and a canal layer in a multilayer by turns. Moreover, JIS of an edible film Even if it packs the food of the shape of liquids, such as soup, or a paste by being 25 degrees C in temperature, and making into below 100 g/m2 and day the steam transmittance measured based on Z-0208 under the atmosphere of 90% of humidity, it can prevent that the moisture of food leaks out through an edible film.

[0006] With the edible film concerning this invention, the edible base film with which water-soluble polysaccharide and gelatin were mixed and formed is used. The gelatin which forms this edible base film is water-soluble polysaccharide and compatibility, and the melting point is about 40 degrees C. For this reason, rather than the edible base film which consists only of water-soluble polysaccharide, the melting point of the edible base film with which gelatin and water-soluble polysaccharide were blended is shifted to a low temperature side, and presents moderate heat-sealing nature. Moreover, the edible film in which the canal layer which makes a principal component the waxes used for the edible base film with which water-soluble polysaccharide and gelatin were mixed and formed as a food grade was formed can improve moisture permeability-proof rather than the edible film in which the same canal layer was formed on the edible base film formed only from water-soluble polysaccharide or gelatin. This phenomenon is imagined to be what is based on an interaction with the canal layer which makes a principal component the waxes used as the edible base film with which water-soluble polysaccharide and gelatin were mixed and formed, and a food grade.

[0007]

[Embodiments of the Invention] In this invention, it is important to use the edible base film with which water-soluble polysaccharide and gelatin were mixed and formed. if it is what has film formation nature as water-soluble polysaccharide used by this invention here -- it can be used -- salts, such as an alginic acid and its sodium salt, a furcellaran, a carrageenan, an agar, pectin, tamarind gum, xanthan gum, Cyamoposis Gum, and a tare -- edible cellulosics, such as gum, locust bean gum, gellant gum, gum arabic, cassia gum, glucomannan, an arabinogalactan, a pullulan, chitosan, starch, a dextrin, and a carboxymethyl cellulose, etc. can be mentioned In this water-soluble polysaccharide, in consideration of other physical properties etc., salts, such as an alginic acid and its sodium salt, a furcellaran, a carrageenan, and an agar are desirable, and an agar is desirable from viewpoints, such as handling nature and acquisition ease, especially.

[0008] What is marketed can be used as gelatin which carries out mixed use with this water-soluble polysaccharide, you may be any of the gelatin which extracted [alkali-] or extracted [acid-], and kinds, such as a cow bone and a pig skin, are not asked as a raw material. Since the melting point is about 40 degrees C, if this gelatin has too many amounts of mixtures of gelatin, the blocking which the edible base films obtained even if water-soluble polysaccharide was mixed stick will generate it. For this reason, it is desirable to use the amount of mixtures of gelatin as 95 or less % of the weight of the edible base film which can be obtained, and it is desirable to carry out to 10% of the weight or more of an edible base film from a viewpoint of heat-sealing nature mentioned later. You may add polyhydric alcohol that flexibility should be added to the edible base film other than this water-soluble polysaccharide and gelatin. As this polyhydric alcohol, saccharides and oligosaccharides, such as sugar-

alcohol, such as polyhydric alcohol, such as ethylene glycol, a propylene glycol, and a glycerol, a sorbitol, a maltitol, and a reduction starch-sugar ghost, a glucose, and a maltose, can be used. As for the addition of this polyhydric alcohol, it is desirable to consider as 20 - 100 % of the weight to water-soluble polysaccharide and gelatin.

[0009] In case an edible base film is produced using such water-soluble polysaccharide and gelatin, first, the water-soluble polysaccharide and gelatin of the specified quantity are distributed and dissolved in water or hot water, and the solution which performed degassing processing further is cast into the front-face side of base materials, such as a drum, a steel band belt, plastic film, and a sheet, so that it may become predetermined thickness. Furthermore, stoving is performed to the film-like object cast into the front-face side of a base material by the heat transfer from the front-face side of a base material, or a rear-face side, hot blast, far-infrared radiation, etc. An edible base film can be obtained by performing this dryness until the moisture of a film-like object becomes 20% or less.

[0010] Although heat-sealing nature of the edible base film obtained is improving rather than the edible base film which consists only of water-soluble polysaccharide so that it may mention later, it cannot improve moisture permeability-proof. This is shown in drawing 1 . drawing 1 -- the mixing ratio of the agar as water-soluble polysaccharide, and gelatin -- it is the graph which showed the result which changed the rate and measured steam transmittance (temperature of 25 degrees C and under [of 95% of humidity] atmosphere) about the edible base film based on JISZ-0208 In drawing 1 , the blending ratio of coal of gelatin increases and the blending ratio of coal of an agar is the edible base film with which 0% of point consists only of gelatin, so that the blending ratio of coal of an agar decreases. On the other hand, the blending ratio of coal of gelatin decreases and the blending ratio of coal of an agar is the edible base film with which 100% of point consists only of an agar, so that the blending ratio of coal of an agar increases. the inclination for steam transmittance to decrease should hear, so that from drawing 1 and the blending ratio of coal of gelatin increases (so that the blending ratio of coal of an agar decreases) -- ** is inadequate the extent

[0011] In this point and this invention, the heat-sealing nature and the moisture permeability-proof of an edible film which were acquired can be improved by forming the canal layer which is chosen from the waxes of the edible base film with which water-soluble polysaccharide and gelatin were mixed and formed used for a whole surface side as a food grade at least, natural resin, and an emulsifier and which makes a kind a principal component at least. As matter which forms this canal layer, a kind or two sorts or more of matter chosen from food-grade emulsifiers, such as food-grade natural resin, such as food-grade waxes, such as beeswax, a candelilla wax, a rice bran wax, and paraffin wax, a shellac, and chill KUGAMU, a glycerine fatty acid ester, a sucrose fatty acid ester, and a acetylation monoglyceride, can be used. It is desirable to adopt the coating method which was suitable for the physical properties of the matter in this matter although the canal layer could be formed by [of an edible base film] coating a whole surface side at least. For example, in using waxes and natural resin, after carrying out heating fusion of these and coating an edible base film by the rolling method or the blade method, a canal layer can be formed by carrying out cooling solidification. Moreover, in using a food-grade emulsifier, after coating an edible base film with the solution which dissolved the food-grade emulsifier in solvents, such as ethanol, with a spray etc., a canal layer can be formed by removing a solvent and drying. Thus, as for the formed canal layer thickness, it is desirable to be referred to as 0.1-25 micrometers, and, as for the sum total thickness of a canal layer and an edible base film, it is desirable to be referred to as 10-100 micrometers.

[0012] By forming this canal layer in the whole surface side of an edible base film shows to drawing 2 that moisture permeability-proof can be improved. drawing 2 -- the mixing ratio of the agar as water-soluble polysaccharide, and gelatin -- the edible film formed and obtained by the sucrose fatty acid ester as a food-grade emulsifier on the edible base film which changed and obtained the rate -- JIS Z-0208 -- being based -- the temperature of 25 degrees C -- and it is the graph which showed the result which measured steam transmittance under the atmosphere of 95% of humidity This edible film applies the solution which dissolved the sucrose fatty acid ester in ethanol on this solidification object, after making predetermined thickness cast and solidify the mixed solution of an agar and gelatin, and it dries after that

and it obtains it. The canal layer formed on the edible base film is based on the so-called wet coating method formed in the state of un-drying an edible base film. 2 / 8 - 8/2, and when it is especially 2 / 8 - 6/4, the mixing ratio (an agar/gelatin) of an agar and gelatin can fall steam transmittance rather than the edible film in which the same canal layer was formed on the edible base film which consists only of an agar or gelatin, so that clearly from drawing 2 . In addition, the sucrose fatty acid ester which forms a canal layer can fall the steam transmittance of an edible film as are shown in drawing 3 and it increases the amount.

[0013] Although drawing 2 and drawing 3 showed the steam transmittance of the edible film which formed the canal layer by the so-called wet coating method, the edible film which forms a canal layer on the edible base film which dryness completed and which formed the canal layer by the so-called dry coating method can also fall the steam transmittance. This is shown in drawing 4 . The edible film which presents the steam transmittance shown in drawing 4 forms and obtains the canal layer which consists of a acetylation monoglyceride by the dry coating method to the whole surface side of the edible base film which mixed and formed an agar and gelatin. As shown in drawing 4 , steam transmittance can be fallen rather than the edible film in which the same canal layer was formed on the edible base film with which the edible film which formed the canal layer by the dry coating method also consists only of an agar or gelatin by setting the mixing ratio (an agar/gelatin) of an agar and gelatin to 2 / 8 - 8/2 (especially 2 / 8 - 6/4). Furthermore, the acetylation monoglyceride which forms a canal layer can fall the steam transmittance of an edible film as are shown in drawing 5 and it increases the amount. As shown in drawing 2 and drawing 4 , the steam transmittance of an edible film falls in the range of specification [the mixed rate of an agar and gelatin]. Such a phenomenon is imagined to be what is based on the interaction in the interface of the edible base film with which an agar and gelatin were mixed and formed, and a canal layer.

[0014] Although the steam transmittance of the edible film shown in drawing 2 - drawing 5 falls to about about 1 of the steam transmittance of the edible base film which forms a canal layer / 6, it is high as compared with the steam transmittance of general-purpose plastic film, such as polyethylene. For this reason, it is desirable to form a canal layer using food-grade waxes to fall the steam transmittance of an edible film further. In case a canal layer is formed using food-grade waxes, a canal layer can be formed on an edible base film by heating the dry edible base film with a hot plate etc., carrying out heating fusion of the food-grade waxes of the specified quantity on the heated edible base film, and applying the food-grade waxes fused by the bar coating machine etc. so that it may become fixed thickness.

[0015] The steam transmittance of the edible film with which this canal layer was formed is shown in drawing 6 . Drawing 6 is a graph which shows the steam transmittance of the edible film with which the mixing ratio (an agar/gelatin) of an agar and gelatin changed the coverage of a bead wax (product made from KOTOBUKI), and formed the canal layer on two eighths of edible base films. The measuring method of steam transmittance is the same as that of drawing 1 - drawing 5 . When the coverage of a bead wax carries out to or more [100cm] 0.1g / 2, suppose that it is 50 g/m2 and day about the steam transmittance of an edible film, so that clearly from drawing 6 . This steam transmittance is a value near the steam transmittance of general-purpose plastic film, such as polyethylene. Thus, it is 25 degrees C in temperature, and is JIS under the atmosphere of 90% of humidity. According to the packing material using the edible film with which the steam transmittance measured based on Z-0208 becomes below 100 g/m2 and day, even if it packs comparatively watery food, it can prevent that the moisture of food leaks out through a packing material.

[0016] In packing a multi-water erosion article with much moisture of **, raw bean paste, etc., the sensibility and the bird clapper with which the packing-material front face became wet are during prolonged preservation only with the edible film of the monolayer which consists of an edible base film and a canal layer. For this reason, in order to improve still much more moisture permeability-proof of an edible film, it is desirable to consider as the multilayer edible film which formed the edible base film and the canal layer in the multilayer by turns. After this multilayer edible film forms the edible film of the monolayer which consists of an edible base film and a canal layer beforehand, it can carry out the laminating of the edible film of the monolayer of two or more sheets, and can obtain it by putting and

unifying between the heating rollers of a couple. As for the thickness of the obtained multilayer edible film, it is desirable to consider as about 2-5 layers in consideration of heat-sealing nature etc., and to be referred to as 200 micrometers or less. According to the multilayer edible film which carried out the laminating of an edible base film and the about three layers of the canal layers by turns, even if it packs and saves raw bean paste, the front face of a multilayer edible film can hold the state where it dried.
[0017] Each heat-sealing nature of the edible film shown in drawing 2 - drawing 6 can be easily heat sealed with a good and general-purpose impulse sealer. This heat-sealing nature is considered to be based on the melting point of the edible base film which forms the edible film shown in drawing 2 - drawing 6 within the limits of the seal temperature by the general-purpose impulse sealer existing. That is, as shown in drawing 7 , when the mixing ratio (an agar/gelatin) of an agar and gelatin measures the melting point of two eighths of edible base films by automatic melting point apparatus (DSC), a melting peak exists in 60-80 degrees C which is within the limits of the seal temperature by the general-purpose impulse sealer, and heat-sealing nature by the general-purpose impulse sealer can be made good. On the other hand, with the edible base film which consists only of an agar, the melting point peak does not exist clearly below 100 degrees C, and the heat-sealing nature by the general-purpose impulse sealer is inferior. On the other hand, the melting point peak exists in about 50 degrees C, and the blocking which edible base films stick in a low-temperature field tends to generate the edible base film which consists only of gelatin.
[0018] Thus, the edible film whose heat-sealing nature improved heat seals a predetermined part using the impulse sealer currently used widely, and can form it in the packing material of a predetermined configuration easily. Since moisture permeability-proof of the edible film which forms this packing material is improving, the initial state of the held food can be saved. Furthermore, since the packing material is formed with the edible film, while a packing material cooks, it is easily dissolved into a boiling water. For this reason, the food currently packed can be used for cooking, without breaking a packing material. In addition, in the above explanation, although the canal layer was formed in the whole surface side of an edible base film, you may form a canal layer in both sides of an edible base film.
[0019]
[Example] Hereafter, an example explains this invention in detail still in detail.
After distributing in 92g of water, the temperature up of the example 1 gelatin 3g, 1g [of agars], and glycerol 3g was carried out to 85 degrees C or more, and it carried out the heating dissolution. After carrying out reduced pressure degassing, keeping warm the obtained solution at 50 degrees C or more, the solution was cast on the polyethylene-terephthalate sheet, carried out hot air drying, and the edible base film with a thickness of 30 micrometers was obtained. Subsequently, it was made to dry and the edible film was obtained, after applying 1% ethanol solution of a acetylation monoglyceride (TAIYO KAGAKU CO., LTD. make S-11) to the whole surface side of this edible base film. A canal layer with a thickness of 1 micrometer to which the obtained edible film changes from a acetylation monoglyceride to the with a thickness of 30 micrometers whole surface side of an edible base film is formed. Even if it bent this edible film, a laminated structure did not break and it collapsed within 3 minutes in the warm water which is 85 degrees C. Moreover, it is 25 degrees C in temperature about this edible film, and is JIS under the atmosphere of 90% of humidity. The steam transmittance measured based on Z-0208 was 90 g/m2 and day. Furthermore, when asked by the heat seal strength test which measures a maximum load until the portion of 15mm width of face which heat sealed the seal intensity of this edible film based on JIS-Z exfoliates, they were 0.22kg / 15mm.
[0020] In example of comparison 1 example 1, the edible base film formed only with the agar was used as an edible base film, and also it is edible film **** like an example 1. About this edible film, it is 25 degrees C in temperature, and is JIS under the atmosphere of 90% of humidity. The steam transmittance measured based on Z-0208 was 1300 g/m2 and day. Moreover, the seal intensity measured like the example 1 about this edible film was also 0.08kg / 15mm.
[0021] In example of comparison 2 example 1, the edible base film formed only with gelatin was used as an edible base film, and also it is edible film **** like an example 1. About this edible film, it is 25

degrees C in temperature, and is JIS under the atmosphere of 90% of humidity. The steam transmittance measured based on Z-0208 was 980 g/m2 and day. Moreover, the seal intensity measured like the example 1 about this edible film was also 0.17kg / 15mm.

[0022] The edible film of three sheets obtained in the example 2 example 1 was put and rolled out between the heating rollers of the couple which the fluororesin was coated and was heated by 80 degrees C, and the multilayer edible film was obtained. Even if the three-layer laminating of this multilayer edible film is carried out by turns and the edible base film and the canal layer bent it, a laminated structure did not break. About this multilayer edible film, it is 25 degrees C in temperature, and is JIS under the atmosphere of 90% of humidity. The steam transmittance measured based on Z-0208 was 60 g/m2 and day. Moreover, the seal intensity measured like the example 1 about this multilayer edible film was also 0.23kg / 15mm.

[0023] After making example 3 gelatin 4g swell by 40g of water for 1 hour, it was made to heat and dissolve in 40 degrees C, and considered as the gelatin solution. Moreover, after making 52g of water distribute 1g [of agars], and glycerol 3g, it warmed and dissolved in 90 degrees C or more, and considered as the agar solution. The mixed liquor which mixed and carried out degassing of this gelatin solution and the agar solution, and obtained them was cast on the polyethylene-terephthalate sheet, carried out hot air drying, and the edible base film with a thickness of 30 micrometers was obtained. Subsequently, after applying the melting wax which fused and obtained beeswax at 90 degrees C on the front face of this edible base film by the bar coating machine, cooling solidification was carried out and the edible film was obtained. Furthermore, the edible film of three sheets was obtained similarly. Then, the obtained edible film of three sheets was put and rolled out between the heating rollers of the couple which the fluororesin was coated and was heated by 80 degrees C, and the multilayer edible film was obtained. Even if the three-layer laminating of an edible base film and the canal layer is carried out by turns, the three-layer laminating of an edible base film and the canal layer is carried out by turns and it bent this multilayer edible film, a laminated structure did not break. About this multilayer edible film, it is 25 degrees C in temperature, and is JIS under the atmosphere of 90% of humidity. The steam transmittance measured based on Z-0208 was 32 g/m2 and day. Moreover, the seal intensity measured like the example 1 about this multilayer edible film was also 0.21kg / 15mm.

[0024]

[Effect of the Invention] Both the edible films concerning this invention can improve the moisture permeability-proof and heat-sealing nature. Consequently, according to the packing material using the edible film concerning this invention, it can carry out to the ability also of the food which can form the packing material of a predetermined configuration easily, and contains the moisture of raw bean paste etc. not to mention dried foods, such as powdered soup of instant Chinese noodles or instant noodles or a seasoning, and dehydrated vegetables, to be packed.

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TECHNICAL FIELD

[The technical field to which invention belongs] this invention relates to the edible film which a canal layer is formed on the edible base film used for packing of food etc. still in detail about an edible film, and changes.

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PRIOR ART

[Description of the Prior Art] By packing the powdered soup of instant Chinese noodles or instant noodles or a seasoning, dehydrated vegetables, etc. by packing materials, such as a bag using the edible film which consists of water-soluble polysaccharide, such as a carrageenan, at the time of transportation and preservation, the quality and the form of contents are maintainable, and at the time of cooking, contents can be contacted in boiling water, without a packing material's melting and breaking a packing material by covering boiling water over a packing material. However, in the packing material using the edible film which consists only of water-soluble polysaccharide, since moisture permeability-proof is inferior as compared with the packing material by which others are used widely, using for a packing material the edible film with which canal layers, such as a wax of a food grade, were formed on the edible base film which consists of water-soluble polysaccharide is proposed (for example, references, such as JP,63-240752,A).

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EFFECT OF THE INVENTION

[Effect of the Invention] Both the edible films concerning this invention can improve the moisture permeability-proof and heat-sealing nature. Consequently, according to the packing material using the edible film concerning this invention, it can carry out to the ability also of the food which can form the packing material of a predetermined configuration easily, and contains the moisture of raw bean paste etc. not to mention dried foods, such as powdered soup of instant Chinese noodles or instant noodles or a seasoning, and dehydrated vegetables, to be packed.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] According to the packing material using the edible film with which canal layers, such as a wax of a food grade, were formed on the edible base film which consists of water-soluble polysaccharide, moisture permeability-proof can be improved as compared with the packing material which consists only of an edible base film. However, it became clear that the moisture of food leaks out through an edible film also with the edible film whose moisture permeability-proof improved in packing food with much moisture of raw bean paste etc. For this reason, improvement in the further moisture permeability-proof of an edible film is called for. Moreover, the edible film which consists of water-soluble polysaccharide, such as a carrageenan, is inferior to general-purpose plastic film in heat-sealing nature, and packing materials, such as a bag, cannot be formed easily, but improvement in the heat-sealing nature of an edible film is also called for. Then, the technical problem of this invention is rather than the edible film which consists of the edible film which consists of water-soluble polysaccharide, such as the conventional carrageenan, to offer the edible film moisture permeability-proof and whose heat-sealing nature improved.

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MEANS

[Means for Solving the Problem] As a result of inquiring that the aforementioned technical problem should be solved, this invention person etc. to the whole surface side of the edible base film which mixed and formed an agar and gelatin The edible film in which the canal layer which consists of the wax of a food grade etc. was formed As compared with the edible film in which the canal layer which consists of the wax of a food grade etc. was formed, it found out that moisture permeability-proof and heat-sealing nature could be improved, and the whole surface side of the edible base film which consists only of an agar or gelatin was reached at this invention. The edible base film with which the water-soluble polysaccharide and gelatin which are used for packing of food etc. were mixed and formed at least this invention namely, to a whole surface side It is the edible film which the canal layer which is chosen from the waxes, the natural resin, and the emulsifier which are used as a food grade, and which makes a kind a principal component at least is formed, and changes. JIS of this edible film The steam transmittance measured based on Z-0208 It is in the edible film characterized by being smaller than the steam transmittance of the edible film which the same canal layer as the aforementioned canal layer is formed on the edible base film formed only from the aforementioned water-soluble polysaccharide or gelatin, and changes.
[0005] In this this invention, the moisture permeability-proof of an edible film can be improved by setting the mixing ratio (water-soluble polysaccharide / gelatin) of the water-soluble polysaccharide of an edible base film, and gelatin to 2 / 8 - 8/2 (especially 2 / 8 - 6/4). Furthermore, the moisture permeability-proof of an edible film can be further improved by forming an edible base film and a canal layer in a multilayer by turns. Moreover, JIS of an edible film Even if it packs the food of the shape of liquids, such as soup, or a paste by being 25 degrees C in temperature, and making into below 100 g/m2 and day the steam transmittance measured based on Z-0208 under the atmosphere of 90% of humidity, it can prevent that the moisture of food leaks out through an edible film.
[0006] With the edible film concerning this invention, the edible base film with which water-soluble polysaccharide and gelatin were mixed and formed is used. The gelatin which forms this edible base film is water-soluble polysaccharide and compatibility, and the melting point is about 40 degrees C. For this reason, rather than the edible base film which consists only of water-soluble polysaccharide, the melting point of the edible base film with which gelatin and water-soluble polysaccharide were blended is shifted to a low temperature side, and presents moderate heat-sealing nature. Moreover, the edible film in which the canal layer which makes a principal component the waxes used for the edible base film with which water-soluble polysaccharide and gelatin were mixed and formed as a food grade was formed can improve moisture permeability-proof rather than the edible film in which the same canal layer was formed on the edible base film formed only from water-soluble polysaccharide or gelatin. This phenomenon is imagined to be what is based on an interaction with the canal layer which makes a principal component the waxes used as the edible base film with which water-soluble polysaccharide and gelatin were mixed and formed, and a food grade.
[0007]
[Embodiments of the Invention] In this invention, it is important to use the edible base film with which

water-soluble polysaccharide and gelatin were mixed and formed. if it is what has a film plasticity as water-soluble polysaccharide used by this invention here -- it can be used -- salts, such as an alginic acid and its sodium salt, a furcellaran, a carrageenan, an agar, pectin, tamarind gum, xanthan gum, Cyamoposis Gum, and a tare -- edible cellulosics, such as gum, locust bean gum, gellant gum, gum arabic, cassia gum, glucomannan, an arabinogalactan, a pullulan, chitosan, starch, a dextrin, and a carboxymethyl cellulose, etc. can be mentioned In this water-soluble polysaccharide, in consideration of other physical properties etc., salts, such as an alginic acid and its sodium salt, a furcellaran, a carrageenan, and an agar are desirable, and an agar is desirable from viewpoints, such as handling nature and acquisition ease, especially.

[0008] What is marketed can be used as gelatin which carries out mixed use with this water-soluble polysaccharide, you may be any of the gelatin which extracted [alkali-] or extracted [acid-], and kinds, such as a cow bone and a pig skin, are not asked as a raw material. Since the melting point is about about 40 degrees C, if this gelatin has too many amounts of mixtures of gelatin, the blocking which the edible base films obtained even if water-soluble polysaccharide was mixed stick will generate it. For this reason, it is desirable to use the amount of mixtures of gelatin as 95 or less % of the weight of the edible base film which can be obtained, and it is desirable to carry out to 10% of the weight or more of an edible base film from a viewpoint of heat-sealing nature mentioned later. You may add polyhydric alcohol that flexibility should be added to the edible base film other than this water-soluble polysaccharide and gelatin. As this polyhydric alcohol, saccharides and oligosaccharides, such as sugar-alcohol, such as polyhydric alcohol, such as ethylene glycol, a propylene glycol, and a glycerol, a sorbitol, a maltitol, and a reduction starch-sugar ghost, a glucose, and a maltose, can be used. As for the addition of this polyhydric alcohol, it is desirable to consider as 20 - 100 % of the weight to water-soluble polysaccharide and gelatin.

[0009] In case an edible base film is produced using such water-soluble polysaccharide and gelatin, first, the water-soluble polysaccharide and gelatin of the specified quantity are distributed and dissolved in water or hot water, and the solution which performed degassing processing further is cast into the front-face side of base materials, such as a drum, a steel band belt, plastic film, and a sheet, so that it may become predetermined thickness. Furthermore, stoving is performed to the film-like object cast into the front-face side of a base material by the heat transfer from the front-face side of a base material, or a rear-face side, hot blast, far-infrared radiation, etc. An edible base film can be obtained by performing this dryness until the moisture of a film-like object becomes 20% or less.

[0010] Although heat-sealing nature of the edible base film obtained is improving rather than the edible base film which consists only of water-soluble polysaccharide so that it may mention later, it cannot improve moisture permeability-proof. This is shown in drawing 1 . drawing 1 -- the mixing ratio of the agar as water-soluble polysaccharide, and gelatin -- it is the graph which showed the result which changed the rate and measured steam transmittance (temperature of 25 degrees C and under [of 95% of humidity] atmosphere) about the edible base film based on JISZ-0208 In drawing 1 , the blending ratio of coal of gelatin increases and the blending ratio of coal of an agar is the edible base film with which 0% of point consists only of gelatin, so that the blending ratio of coal of an agar decreases. On the other hand, the blending ratio of coal of gelatin decreases and the blending ratio of coal of an agar is the edible base film with which 100% of point consists only of an agar, so that the blending ratio of coal of an agar increases. the inclination for steam transmittance to decrease should hear, so that from drawing 1 and the blending ratio of coal of gelatin increases (so that the blending ratio of coal of an agar decreases) -- ** is inadequate the extent

[0011] In this point and this invention, the heat-sealing nature and the moisture permeability-proof of an edible film which were acquired can be improved by forming the canal layer which is chosen from the waxes of the edible base film with which water-soluble polysaccharide and gelatin were mixed and formed used for a whole surface side as a food grade at least, natural resin, and an emulsifier and which makes a kind a principal component at least. As matter which forms this canal layer, a kind or two sorts or more of matter chosen from food-grade emulsifiers, such as food-grade natural resin, such as food-grade waxes, such as beeswax, a candelilla wax, a rice bran wax, and paraffin wax, a shellac, and chill

KUGAMU, a glycerine fatty acid ester, a sucrose fatty acid ester, and a acetylation monoglyceride, can be used. It is desirable to adopt the coating method which was suitable for the physical properties of the matter in this matter although the canal layer could be formed by [of an edible base film] coating a whole surface side at least. For example, in using waxes and natural resin, after carrying out heating fusion of these and coating an edible base film by the rolling method or the blade method, a canal layer can be formed by carrying out cooling solidification. Moreover, in using a food-grade emulsifier, after coating an edible base film with the solution which dissolved the food-grade emulsifier in solvents, such as ethanol, with a spray etc., a canal layer can be formed by removing a solvent and drying. Thus, as for the formed canal layer thickness, it is desirable to be referred to as 0.1-25 micrometers, and, as for the sum total thickness of a canal layer and an edible base film, it is desirable to be referred to as 10-100 micrometers.

[0012] By forming this canal layer in the whole surface side of an edible base film shows to drawing 2 that moisture permeability-proof can be improved. drawing 2 -- the mixing ratio of the agar as water-soluble polysaccharide, and gelatin -- the edible film formed and obtained by the sucrose fatty acid ester as a food-grade emulsifier on the edible base film which changed and obtained the rate -- JIS Z-0208 -- being based -- the temperature of 25 degrees C -- and it is the graph which showed the result which measured steam transmittance under the atmosphere of 95% of humidity This edible film applies the solution which dissolved the sucrose fatty acid ester in ethanol on this solidification object, after making predetermined thickness cast and solidify the mixed solution of an agar and gelatin, and it dries after that and it obtains it. The canal layer formed on the edible base film is based on the so-called wet coating method formed in the state of un-drying an edible base film. 2 / 8 - 8/2, and when it is especially 2 / 8 - 6/4, the mixing ratio (an agar/gelatin) of an agar and gelatin can fall steam transmittance rather than the edible film in which the same canal layer was formed on the edible base film which consists only of an agar or gelatin, so that clearly from drawing 2 . In addition, the sucrose fatty acid ester which forms a canal layer can fall the steam transmittance of an edible film as are shown in drawing 3 and it increases the amount.

[0013] Although drawing 2 and drawing 3 showed the steam transmittance of the edible film which formed the canal layer by the so-called wet coating method, the edible film which forms a canal layer on the edible base film which dryness completed and which formed the canal layer by the so-called dry coating method can also fall the steam transmittance. This is shown in drawing 4 . The edible film which presents the steam transmittance shown in drawing 4 forms and obtains the canal layer which consists of a acetylation monoglyceride by the dry coating method to the whole surface side of the edible base film which mixed and formed an agar and gelatin. As shown in drawing 4 , steam transmittance can be fallen rather than the edible film in which the same canal layer was formed on the edible base film with which the edible film which formed the canal layer by the dry coating method also consists only of an agar or gelatin by setting the mixing ratio (an agar/gelatin) of an agar and gelatin to 2 / 8 - 8/2 (especially 2 / 8 - 6/4). Furthermore, the acetylation monoglyceride which forms a canal layer can fall the steam transmittance of an edible film as are shown in drawing 5 and it increases the amount. As shown in drawing 2 and drawing 4 , the steam transmittance of an edible film falls in the range of specification [the mixed rate of an agar and gelatin]. Such a phenomenon is imagined to be what is based on the interaction in the interface of the edible base film with which an agar and gelatin were mixed and formed, and a canal layer.

[0014] Although the steam transmittance of the edible film shown in drawing 2 - drawing 5 falls to about about 1 of the steam transmittance of the edible base film which forms a canal layer / 6, it is high as compared with the steam transmittance of general-purpose plastic film, such as polyethylene. For this reason, it is desirable to form a canal layer using food-grade waxes to fall the steam transmittance of an edible film further. In case a canal layer is formed using food-grade waxes, a canal layer can be formed on an edible base film by heating the dry edible base film with a hot plate etc., carrying out heating fusion of the food-grade waxes of the specified quantity on the heated edible base film, and applying the food-grade waxes fused by the bar coating machine etc. so that it may become fixed thickness.

[0015] The steam transmittance of the edible film with which this canal layer was formed is shown in

drawing 6 . Drawing 6 is a graph which shows the steam transmittance of the edible film with which the mixing ratio (an agar/gelatin) of an agar and gelatin changed the coverage of a bead wax (product made from KOTOBUKI), and formed the canal layer on two eighths of edible base films. The measuring method of steam transmittance is the same as that of drawing 1 - drawing 5 . When the coverage of a bead wax carries out to or more [100cm] 0.1g / 2, suppose that it is 50 g/m2 and day about the steam transmittance of an edible film, so that clearly from drawing 6 . This steam transmittance is a value near the steam transmittance of general-purpose plastic film, such as polyethylene. Thus, it is 25 degrees C in temperature, and is JIS under the atmosphere of 90% of humidity. According to the packing material using the edible film with which the steam transmittance measured based on Z-0208 becomes below 100 g/m2 and day, even if it packs comparatively watery food, it can prevent that the moisture of food leaks out through a packing material.

[0016] In packing a multi-water erosion article with much moisture of **, raw bean paste, etc., the sensibility and the bird clapper with which the packing-material front face became wet are during prolonged preservation only with the edible film of the monolayer which consists of an edible base film and a canal layer. For this reason, in order to improve still much more moisture permeability-proof of an edible film, it is desirable to consider as the multilayer edible film which formed the edible base film and the canal layer in the multilayer by turns. After this multilayer edible film forms the edible film of the monolayer which consists of an edible base film and a canal layer beforehand, it can carry out the laminating of the edible film of the monolayer of two or more sheets, and can obtain it by putting and unifying between the heating rollers of a couple. As for the thickness of the obtained multilayer edible film, it is desirable to consider as about 2-5 layers in consideration of heat-sealing nature etc., and to be referred to as 200 micrometers or less. According to the multilayer edible film which carried out the laminating of an edible base film and the about three layers of the canal layers by turns, even if it packs and saves raw bean paste, the front face of a multilayer edible film can hold the state where it dried.

[0017] Each heat-sealing nature of the edible film shown in drawing 2 - drawing 6 can be easily heat sealed with a good and general-purpose impulse sealer. This heat-sealing nature is considered to be based on the melting point of the edible base film which forms the edible film shown in drawing 2 - drawing 6 within the limits of the seal temperature by the general-purpose impulse sealer existing. That is, as shown in drawing 7 , when the mixing ratio (an agar/gelatin) of an agar and gelatin measures the melting point of two eighths of edible base films by automatic melting point apparatus (DSC), a melting peak exists in 60-80 degrees C which is within the limits of the seal temperature by the general-purpose impulse sealer, and heat-sealing nature by the general-purpose impulse sealer can be made good. On the other hand, with the edible base film which consists only of an agar, the melting point peak does not exist clearly below 100 degrees C, and the heat-sealing nature by the general-purpose impulse sealer is inferior. On the other hand, the melting point peak exists in about 50 degrees C, and the blocking which edible base films stick in a low-temperature field tends to generate the edible base film which consists only of gelatin.

[0018] Thus, the edible film whose heat-sealing nature improved heat seals a predetermined part using the impulse sealer currently used widely, and can form it in the packing material of a predetermined configuration easily. Since moisture permeability-proof of the edible film which forms this packing material is improving, the initial state of the held food can be saved. Furthermore, since the packing material is formed with the edible film, while a packing material cooks, it is easily dissolved into a boiling water. For this reason, the food currently packed can be used for cooking, without breaking a packing material. In addition, in the above explanation, although the canal layer was formed in the whole surface side of an edible base film, you may form a canal layer in both sides of an edible base film.

[Translation done.]

* NOTICES *

EXAMPLE

[Example] Hereafter, an example explains this invention in detail still in detail.
After distributing in 92g of water, the temperature up of the example 1 gelatin 3g, 1g [of agars], and glycerol 3g was carried out to 85 degrees C or more, and it carried out the heating dissolution. After carrying out reduced pressure degassing, keeping warm the obtained solution at 50 degrees C or more, the solution was cast on the polyethylene-terephthalate sheet, carried out hot air drying, and the edible base film with a thickness of 30 micrometers was obtained. Subsequently, it was made to dry and the edible film was obtained, after applying 1% ethanol solution of a acetylation monoglyceride (TAIYO KAGAKU CO., LTD. make S-11) to the whole surface side of this edible base film. A canal layer with a thickness of 1 micrometer to which the obtained edible film changes from a acetylation monoglyceride to the with a thickness of 30 micrometers whole surface side of an edible base film is formed. Even if it bent this edible film, a laminated structure did not break and it collapsed within 3 minutes in the warm water which is 85 degrees C. Moreover, it is 25 degrees C in temperature about this edible film, and is JIS under the atmosphere of 90% of humidity. The steam transmittance measured based on Z-0208 was 90 g/m2 and day. Furthermore, when asked by the heat seal strength test which measures a maximum load until the portion of 15mm width of face which heat sealed the seal intensity of this edible film based on JIS-Z exfoliates, they were 0.22kg / 15mm.
[0020] In example of comparison 1 example 1, the edible base film formed only with the agar was used as an edible base film, and also it is edible film **** like an example 1. About this edible film, it is 25 degrees C in temperature, and is JIS under the atmosphere of 90% of humidity. The steam transmittance measured based on Z-0208 was 1300 g/m2 and day. Moreover, the seal intensity measured like the example 1 about this edible film was also 0.08kg / 15mm.
[0021] In example of comparison 2 example 1, the edible base film formed only with gelatin was used as an edible base film, and also it is edible film **** like an example 1. About this edible film, it is 25 degrees C in temperature, and is JIS under the atmosphere of 90% of humidity. The steam transmittance measured based on Z-0208 was 980 g/m2 and day. Moreover, the seal intensity measured like the example 1 about this edible film was also 0.17kg / 15mm.
[0022] The edible film of three sheets obtained in the example 2 example 1 was put and rolled out between the heating rollers of the couple which the fluororesin was coated and was heated by 80 degrees C, and the multilayer edible film was obtained. Even if the three-layer laminating of this multilayer edible film is carried out by turns and the edible base film and the canal layer bent it, a laminated structure did not break. About this multilayer edible film, it is 25 degrees C in temperature, and is JIS under the atmosphere of 90% of humidity. The steam transmittance measured based on Z-0208 was 60 g/m2 and day. Moreover, the seal intensity measured like the example 1 about this multilayer edible film was also 0.23kg / 15mm.
[0023] After making example 3 gelatin 4g swell by 40g of water for 1 hour, it was made to heat and dissolve in 40 degrees C, and considered as the gelatin solution. Moreover, after making 52g of water distribute 1g [of agars], and glycerol 3g, it warmed and dissolved in 90 degrees C or more, and considered as the agar solution. The mixed liquor which mixed and carried out degassing of this gelatin

solution and the agar solution, and obtained them was cast on the polyethylene-terephthalate sheet, carried out hot air drying, and the edible base film with a thickness of 30 micrometers was obtained. Subsequently, after applying the melting wax which fused and obtained beeswax at 90 degrees C on the front face of this edible base film by the bar coating machine, cooling solidification was carried out and the edible film was obtained. Furthermore, the edible film of three sheets was obtained similarly. Then, the obtained edible film of three sheets was put and rolled out between the heating rollers of the couple which the fluororesin was coated and was heated by 80 degrees C, and the multilayer edible film was obtained. Even if the three-layer laminating of an edible base film and the canal layer is carried out by turns, the three-layer laminating of an edible base film and the canal layer is carried out by turns and it bent this multilayer edible film, a laminated structure did not break. About this multilayer edible film, it is 25 degrees C in temperature, and is JIS under the atmosphere of 90% of humidity. The steam transmittance measured based on Z-0208 was 32 g/m2 and day. Moreover, the seal intensity measured like the example 1 about this multilayer edible film was also 0.21kg / 15mm.

[Translation done.]

* NOTICES *

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is a graph about the steam transmittance of the edible base film with which an agar and gelatin were mixed and formed.
[Drawing 2] It is a graph about the steam transmittance which shows an example of the edible film concerning this invention.
[Drawing 3] It is a graph about the steam transmittance at the time of changing the canal layer thickness (the amount of coats) formed in the edible film shown in drawing 2 .
[Drawing 4] It is a graph about the steam transmittance which shows other examples of the edible film concerning this invention.
[Drawing 5] It is a graph about the steam transmittance at the time of changing the canal layer thickness (the amount of coats) formed in the edible film shown in drawing 4 .
[Drawing 6] It is the steam transmittance which shows other examples of the edible film concerning this invention, and is a graph about the steam transmittance at the time of changing the formed canal layer thickness (Wax coverage).
[Drawing 7] It is the graph which shows the result which measured each melting point of the edible base film which forms the edible film concerning this invention, gelatin, and an agar by automatic melting point apparatus (DSC).

[Translation done.]

* NOTICES *

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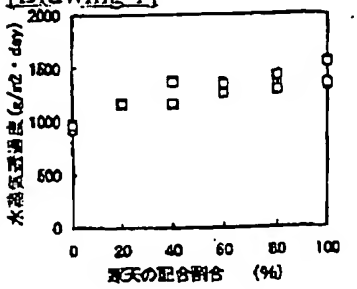
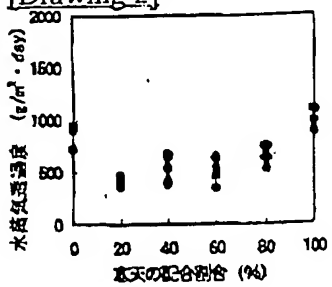
DRAWINGS

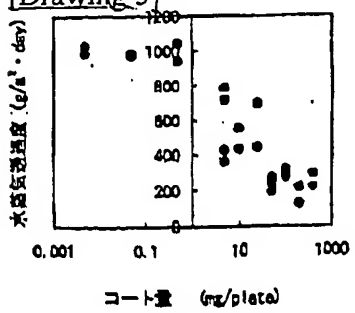
[Drawing 1]



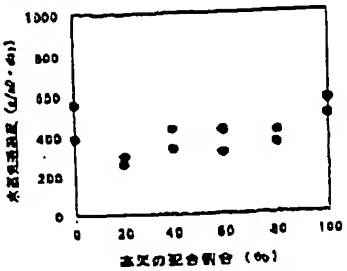
[Drawing 2]



[Drawing 3]



[Drawing 4]



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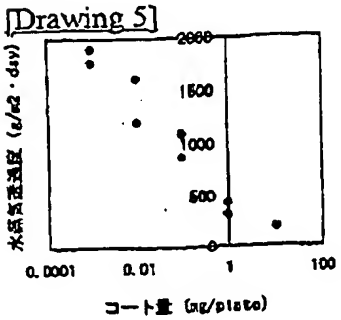
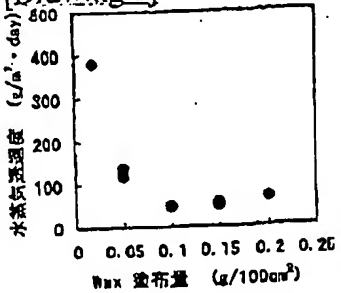
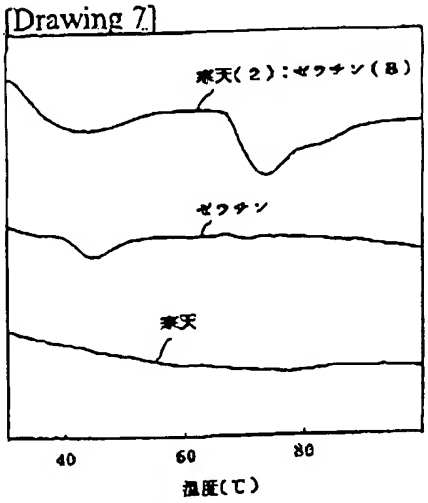


[Drawing 6]



[Drawing 7]



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